

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
31 December 2003 (31.12.2003)

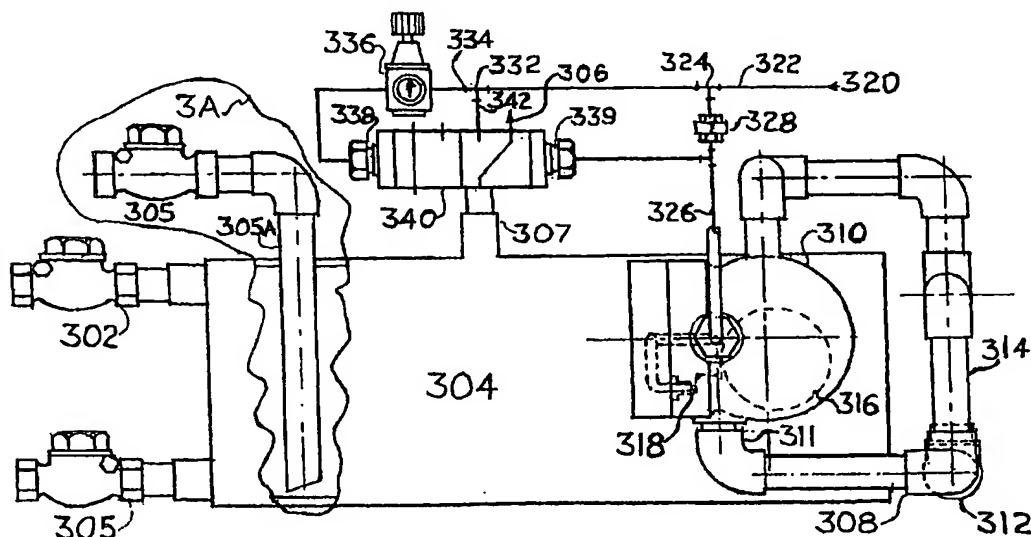
PCT

(10) International Publication Number
WO 2004/001232 A1

- (51) International Patent Classification⁷: F04F 1/06
- (21) International Application Number: PCT/GB2003/002276
- (22) International Filing Date: 10 June 2003 (10.06.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
0214231.3 20 June 2002 (20.06.2002) GB
60/389,932 20 June 2002 (20.06.2002) US
- (71) Applicants and
(72) Inventors: ARMER, Albert [GB/GB]; 66 Gretton Road, Winchcombe, Cheltenham, Gloucestershire GL54 5LE (GB). ARMER, Timothy, John, Moffat [GB/GB]; 66 Gretton Road, Winchcombe, Cheltenham, Gloucestershire GL54 5EL (GB).
- (74) Agents: DUNLOP, Brian, Kenneth, Charles et al.; Wynne-Jones, Laine & James, 22 Rodney Road, Cheltenham, Gloucestershire GL50 1JJ (GB).
- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:
— with international search report

[Continued on next page]

(54) Title: PUMP APPARATUS



(57) Abstract: Pumps for Steam Condensates and other Liquids, comprising receivers that may be connected firstly to the liquid source, and after filling are then pressurised to discharge the liquid to a transfer line, or to a vessel at a higher pressure than that of the source. The use of a small pilot valve to detect the liquid level, mounted externally to each receiver, and controlling the opening and closing of the pressurising and venting valves, enables an unusually low profile to be achieved.

PCT/GB 03/02276

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

IPC 7 F04F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

EPO-Internal, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 321 017 A (GOTTLIEBSON MAYO)	1,2,4,5,
	23 March 1982 (1982-03-23)	7
Y	abstract	3,9
	column 1, line 47 -column 2, line 53	
A	figures	6,10

X	DE 304 197 C (MICHAELIS F)	10,12
	3 December 1916 (1916-12-03)	
A	the whole document	1,7,9

X	FR 936 093 A (GRU NDER FRITZ)	10-12
	8 July 1948 (1948-07-08)	
Y	page 2, line 57 -page 4, line 7	3,9
A	figures 1-3	1,2

	-/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

^o Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

Date of the actual completion of the International search

14 August 2003

Date of mailing of the international search report

26/08/2003

Name and mailing address of the ISA
European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax (+31-70) 340-3016

Authorized officer _____

Kolby, L

INTERNATIONAL SEARCH REPORT

PCT/GB 03/02276

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 1 628 608 A (NEWHOUSE RAY C) 10 May 1927 (1927-05-10)	10-12
A	page 1, line 75 -page 3, line 88 figures	1,2,7,9
X	US 474 338 A (DYER I T) 3 May 1892 (1892-05-03)	10-12
A	page 1, line 18 -page 3, line 9 figures	1,2,7,9

INTERNATIONAL SEARCH REPORT

Information on patent family members

PCT/GB 03/02276

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4321017	A	23-03-1982	NONE	
DE 304197	C		NONE	
FR 936093	A	08-07-1948	NONE	
US 1628608	A	10-05-1927	NONE	
US 474338	A		NONE	